VOLUME VII #4 JANUARY 1992 PRICE $3.50

FOR THE DESIGN, CONSTRUCTION AND ENJOYMENT OF UNUSUAL SOUND SOURCES

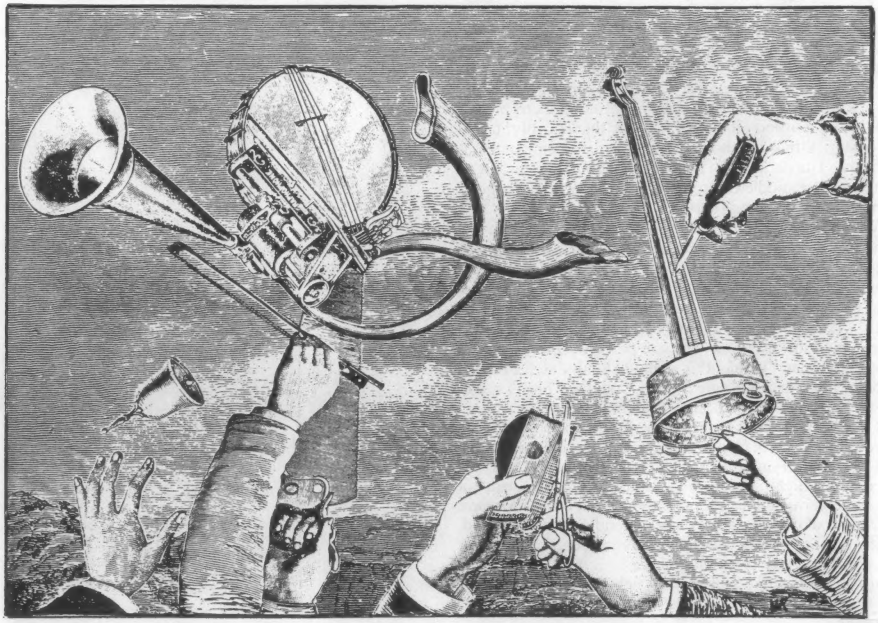
EXPERIMENTAL MUSICAL INSTRUMENTS

WHAT HAVE WE HERE?

John Hajeski has found an idiosyncratic world of electronic sound in inexpensive transistor radio innards, quite different from the sorts of sounds associated with synthesizers and computers. His work is described in this issue of **Experimental Musical Instruments**. Also herein you will find reports on the Danish environmental sound artist William Louis Soerensen, and the performing group TUYO from Quebec. We have the second half of Hal Rammel's history of the Devil's Fiddle family, this portion focussing on Devil's Fiddle makers of recent years. And there's the usual mix of letters, reviews, and additional odds and ends within as well. So, please, open up and read.

Subscribers take note: following this issue, EMI will skip one regular issue date and pickup again thereafter. See page 5 for details.

IN THIS ISSUE



Graphic by Hal Rammel

HERE ARE TWO ITEMS which may interest readers of EMI.

The remains of the instruments of Arthur K. Ferris are in storage in St. Paul, owned by the Schubert Club, which has a fine museum of musical instruments. They are in charge of the Conservator, Richard K. Sorensen, Schubert Club, 302 Landmark Center, St. Paul, Minnesota, 55102 (phone (612) 333-3199). I visited the museum last year and met Mr. Sorensen, and suggested he subscribe to EMI. I guess he didn't, or he would probably have responded to the recent articles.

The following article, from a journal I don't think is ordinarily scanned by EMI, may interest some readers. It is "Combinatorial Music Theory," by Andrew Duncan, in *Journal of the Audio Engineering Society* Vol. 39, No. 6, June 1991, pages 427-448. I am still reading the article, which is fairly difficult. It is changing my ideas of scales and the relations between the notes of scales.

Fred Lipsett

MY THANKS TO KENNETH PEACOCK for "Famous Early Color Organs." What a wealth of information, insight and anecdote! During the last few years, I have been developing a scrolling, sound-synchronized, bar-graph score for listeners, called the Music Animation Machine (which, to my amusement, turns out to have gotten its name in a similar manner to Mary Hallock-Greenewalt's Sarabet: its initials were chosen to match those of my mother, Mary Ann). In the M.A.M. score, color serves to highlight various features of musical structure. So I was fascinated to learn how people in the past had chosen to combine color and music.

As Dr. Peacock points out, a central theme through the history of color-music has been the search for an "indisputable correspondence...between colors and [musical] sounds." While it is unlikely that any assignment of colors to pitches would have satisfied all the color-music theorists of the past few centuries, this does not mean that any such assignment is arbitrary. The people Dr. Peacock mentions who disagreed about whether middle C is red, yellow or blue were, I believe, trying to make the wrong sort of correlation.

What's wrong with it? For a start, consider perfect pitch. Some people have it and some don't. Is there any analogue for color? Not exactly. Nobody says "I can tell red is different from blue when I'm looking at the two colors side by side, but I just can't remember what red is like from one day to the next." True, there are color-blind people and tone-deaf people, but most everyone who can perceive colors can also remember them. To me, this suggests a mismatch between absolute pitch and absolute color. Could we find a better match? Let's save that question for a moment...

I wonder if the early theorists were led astray by confusing the physical nature of light (a continuous range of frequencies, with many different frequencies present at once) and our perception of light. Contrary to popular opinion, we are not able to perceive light at many frequencies at once. We have three types of color receptors, corresponding roughly to red, green and blue. When light falls on a receptor, the degree to which that receptor is stimulated depends on the amount of energy at any given frequency in the light and the closeness of that frequency to the "resonant" frequency of the receptor. So, all the energy at different frequencies is compressed into just three "readings," one for each receptor.

We are able to recognize and remember some characteristics of color better that others. For example, we can easily recognize that a banana is yellow, whether we see it in broad daylight or in shadow, and we are able to remember that color. But it is not so easy to recognize and remember exactly how yellow it was, or how brightly the sun was illuminating it. To put it another way, we are adept at recognizing a given *ratio* in the degrees of stimulation of the three types of receptors (what is called "hue"), but less skilled at recognizing and remembering the *absolute amount* of stimulation (which is described in terms of "saturation" and/or "lightness").

Surprisingly, because hue is not an absolute quantity (like frequency) but a ratio between three absolute quantities, the range of perceptible hues is not a spectrum, but a circle, the artist's "color wheel," with hues going in this order: blue, indigo, violet, magenta, red, vermillion, orange, ocher, yellow, emerald, green, turquoise, blue.

On this color wheel, each hue is similar to the ones adjacent, and less similar to one more distant. Now, back to our saved question. Does this ordering of colors remind you of any ordering in music? Aha: the circle of fifths!

To assign the colors around the color wheel to the notes around the circle of fifths, you have to make a few somewhat

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arbitrary choices. First, you have to choose twelve colors which are distinct from each other. Then, you have to decide where to start, and which direction to go.

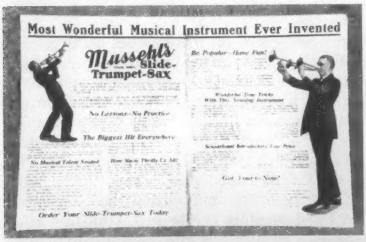
The Music Animation Machine has a mode in which colors are assigned in this way. For this mode, I have settled on these choices: the colors are selected so that there is a pure red, green and blue, the tonic pitch is blue (I picked this because blue suggested "rest" and "home"), and motion toward the dominant corresponds with motion toward red (I picked this because I think of dominant keys as more "active," like red).

Regardless of how these initial choices are made, this coloring scheme has properties which make it useful for studying tonal music: chords which are harmonically close have similar sets of colors, chords which are harmonically distant have contrasting sets of colors, and dissonant notes (which are distant on the circle of fifths) stand out visually. With this coloring, "chromatic" music really is!

Stephen Malinowski
(510) 548-9240

NOTES FROM HERE AND THERE

FROM THE EDITOR: When Jim Leonard and Janet Graebner's **Scratch My Back: A Pictorial History of the Musical Saw** came out a few years ago, I found myself fascinated by a set of photographs appearing on page 18. They were reproductions of advertisements and promotional brochures for several strange instruments, made commercially available in the 1920s: the *Russian Marr-Hoo-Baw, Mussehl's Slide-Trumpet-Sax*, and the *Jazz-o-nette*. All apparently were made by the company of Mussehl & Westphal, best known for their musical saws. In hopes of gathering more information, I contacted author Janet Graebner, but she was unable to tell me more than what appeared in the brief captions in *Scratch My Back*. I next contacted Mary Kay Dawson, now the head of Mussehl & Westphal. Despite her best efforts she was unable to locate the originals from which the *Scratch My Back* photos had been made, nor did she have any further information on the instruments depicted. Ms. Dawson and Ms. Graebner both did, however, generously grant permission to reproduce the photos from the book. Make of them what you can, and if any readers have more information on these instruments, we'd love to hear.



Photographs from SCRATCH MY BACK, by Janet Graebner and Jim Leonard (Kalaidascope Press, 28400 Pinto Dr., Conifer, CO 80433-5309).

eXPERIMENTAL mUSIC pUBLICATIONS

Balungan, a publication of the American Gamelan Institute. Information on all forms of gamelan, Indonesian performing arts, and related developments worldwide. Subscription (two issues) $15 individual, $20 foreign, $30 institution. Archives Distribution Catalog, listing tapes, monographs, scores, and videos, $2. Box A36, Hanover NH 03755.

Frog Peak Music (A Composers' Collective). Publishes scores and books on speculative theory and distributes experimental artist-produced books, recordings, and innovative music software. Catalog on request. Box A36, Hanover NH 03755..

Musicworks: The Canadian Journal of Sound Explorations. Journalistic and audio perspectives on all aspects of music and music-making. Subscription (3 issues annually) $26, includes cassettes. Sample issue (28 pages) with 60 min. cassette, $8.75. 1087 Queen St. West, Toronto, Canada M6J 1H3. (416) 533-0192.

1/1: The Quarterly Journal of the Just Intonation Network, David B. Doty, editor. Serves composers, musicians, instrument designers and theorists working with tunings in Just Intonation. One year membership includes subscription. Individual, $15 US, $17.50 foreign; institution $25. 535 Stevenson, San Francisco CA 94103. (415) 864-8123.

Experimental Musical Instruments. Bimonthly newsletter and yearly cassette documenting new acoustic and electro-acoustic sound sources. Subscription $20/year, tapes $8.50 general, $6 to subscribers. Sample issue on request. PO Box 784, Nicasio CA 94946.

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LAST JUNE WE RAN AN ARTICLE called "A Day in the Patent Library," discussing flexible pitch control systems for clarinets and other winds. One of the approaches described in that article involved an open slit running the length of the instrument, which can by some means be progressively covered over to vary the effective length of the air column. Another involved helical systems, usually employing an inner and an outer tube, with a long slit in each. The slit in one of the tubes is not straight, but spiraled. A through-going opening in the tubes appears only at the point of intersection between the two slits, and this point moves up and down the tube when one tube is rotated relative to the other.

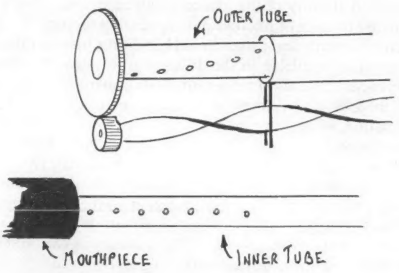
Something over thirty years ago, François and Bernard Baschet made a slide clarinet which employed similar helical elements. The helical components comprised only a small part of the pitch-control system, while the main body of the instrument used a compound telescoping slide mechanism, reminiscent of the trombone but with several telescoping sections. A collapsing "baby gate" type mechanism ensured that the telescoping sections open smoothly and uniformly. François Baschet has provided these notes on the Baschet Slide Clarinet:

The sliding clarinet has five segments. In order to get a larger range, we need a hole at a certain proportion of the tube, a register hole, to create a node. [Opening a small hole at the right location along the tube disrupts the air column in a way that forces the instrument into an upper register — ed.]

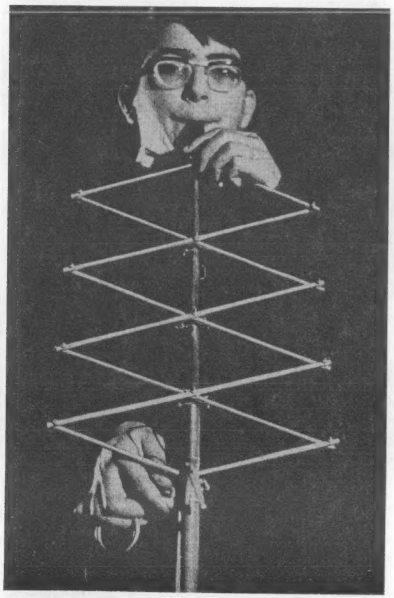
The first segment, closest to the mouth piece, has two concentric tubes. The inside tube is fixed to the mouth piece and turns only together with it. The outside tube can turn loose, but is maintained by a cog wheel operated by a twisted plate held in place by a fork. The inner tube has a series of small holes arrayed in a straight line. A series of holes on the outer tube is arrayed in a curving line. As the outer tube rotates, first one and then another pair of holes comes into alignment to create the opening [see the drawings].

The whole thing was designed in such a way that, according to the length of the whole system there is always an open hole. When the sliding clarinet is extended, the hole is at the right of the picture. When the clarinet is compact, the hole goes to the left. With this hole, a node is created. The sound jumps to a higher register. If you twist the clarinet enough, but keeping the mouthpiece horizontal, there will be no hole at all in front of the holes of the turning tube. No hole, no node. You get the lower register.

My drawing is clumsy and is made after my memories, thirty years ago. The proportions are not right, but I think the description is correct.



The helical register hole system on the Baschet slide clarinet.



The Baschet slide clarinet, played by Teddy Lasry, from an article in Life Magazine, 1962.

Thus, the helical system on the Baschet slide clarinet ensures that, if the player chooses to play in the upper register, a register hole appears at the proportionally correct point along the tube for each vibrating length. If you study François' description and drawing, you'll see that in an extraordinary bit of mechanical cleverness, the location of the register hole is selected automatically by means of the cog-and-twisted-ribbon system, as the slide is extended to varying lengths in the course of playing. It's worth noting that the late Arthur Benade, in his **Fundamentals of Musical Acoustics**, commented that the fixed register holes on the standard clarinet are really inadequate for providing venting close enough to the proper location over the wide range of sounding tube lengths, making the clarinet a more difficult instrument to control than it might otherwise be. Here's a system that provides a much more finely-tuned set of register holes, and even brings them into play automatically.

Notice that the Baschets used a series of closely-spaced holes, rather than a continuous slit. "A slit is difficult to make," François observes. "A series of holes, very close one from the other, gives the same result and is easier to bore." But he suggests that helical systems have drawbacks as compared to flexible strips that can likewise be used to cover long slits or series of closely-spaced holes: "The flexible bentwood is better than the helical system. The helical system is very slow to turn."

François Baschet also had some observations regarding one of the listings in the "Recent Articles in Other Periodicals" section from a recent issue. The listing was for an article on sympathetic strings by Carleen Hutchins of the Catgut Acoustical Society. She concludes that while the presence of unplayed strings in sympathetic vibration adds to a subjective impression of richness in an instrument's sound, they actually reduce the total sound energy output of the system. François adds:

Nature is lazy. Nature has as incredible imagination to avoid sending energy outside acoustical systems. Henri Bouasse said something like this: "The art of instrument making is to create a stationary wave that will expel a progressive wave." As often as not, when you create a new instrument, the energy you put into it will shake the instrument's leg or shake a neighboring note rather than radiating out as sound. Organ makers have the same problem. A stationary wave is created between two pipes and the listener hears nothing.

Sympathetic strings are an example of this phenomenon. The energy stays in the system and you hear no sound.

Still, two or three strings tuned to the unison can make more sound than a single string. We have to refer to the notion of " acceptance" or "input". If you hit three strings instead of one, more energy is forced into the system. The acceptance is bigger. Even if the acoustical ratio is poor because of a stationary wave between the strings, the total output is bigger.

Around 1940 a US patent was taken to damp the noise of electric razors. A free weight attached to a tuned spring would vibrate in unison with the motor, creating a stationary wave that would stay in the system.

The razor patent was supposed to work on any industrial machine creating unwanted vibrations. By creating two opposite vibrations in phase, one makes a tuning fork. The progressive wave created by the system is weak. Chladni put resilient ties to fix his notes to avoid sending the vibration to the neighboring notes, that would vibrate by sympathy.

The main problem I had when I designed the Cristal [a glass and steel instrument described in EMI III #3] was to avoid having a neighbor note vibrating by sympathy so strongly that a glass rod might break. That is why our notes are strongly clamped on a heavy core whose inertia fixes the nodes. This core works as an impedance adapter: The vibrating threaded rod and its glass rod vibrate at low pressure and large amplitude. You can stop it with the finger. In the core, the vibration has a high pressure and small amplitude (you cannot stop it with the hand). Then the sound is "expelled" through cones, folded metal sheets or tuned tubes. All musical instruments are light, as the impedance of air is small. The basis of the Baschet U.S. Patents is the two impedance transformations through a heavy bar such as the core mentioned above.

At one point I started writing tables with multiple entries to study these parameters. This is senseless for nice handy people like us. Practice and experience are more useful for sound sculptors. But no doubt one day some clever acoustician will establish complicated laws and formulas for some Journal of Acoustics. Laws that no one will ever use or read. Sound sculptors are happy singing birds. Acousticians are the tense ornithologists that stand around the cage with their microscopes.

What an interesting profession we have! Shame the Establishment does not share our enthusiasm.

ANYONE CAN WHISTLE

The makers of Woodstock Chimes have expanded their operations to include a line of interesting and unusual musical instruments and sound sources from many makers and cultures. Their **Anyone Can Whistle** catalog has just appeared in recent weeks. Included in this first edition are about seventy items ranging from a set of bird whistles made by Acme, to the Balinese wind-activated bird-shooer called *Pindekan Kulkul*, to Michael Thiele's beautiful tuned tongue drums, to Spacephones, an echoey spring-driven children's sound toy. Available with the catalog is a cassette tape with sound samples from each of the items. Anyone Can Whistle is at PO Box 4407, Kingston, NY 12401, phone (800) 435-8863.

THERE WILL BE NO MARCH ISSUE

EMI's next issue, Volume VII #5, which would normally be dated March, 1992, will be deferred until May (actually appearing around the start of April). The reason for this is that the editor will have unchained himself from his desk for a short sabbatical during the months of December and January. This represents the first break in EMI's bi-monthly publication schedule since the newsletter's inception almost seven years ago. Subscribers' expiration dates will be set forward so that everyone receives the full set of six issues for the yearly subscription.

During the editor's absence we will continue to process subscriptions, but editorial functions will be suspended. For those having editorial correspondence to conduct with us during that period, your patience will be appreciated.

EMI WILL GO QUARTERLY

Experimental Musical Instruments, like all magazines, has been dealing with an on-going rise in production costs, and we are faced with the need to raise subscription rates (our first increase ever). Rather than hitting the readership with a very large increase, we have decided instead to institute a relatively small increase and at the same time partially mitigate the rise in production costs by altering the publication schedule. Since mentioning this possibility in our last issue, we have received a goodly number of responses from readers expressing support for this approach. Here are the details:

The standard subscription price will rise from $20 to $25 per year (and from $27 to $34 overseas).

Issues will appear quarterly instead of bi-monthly. The new issue dates will be October, January, April and July (with each issue actually appearing one month before its cover date).

The number of pages per issue will increase so that the total number of pages per year equals or exceeds what it has been.

Cassette prices will rise to $8 for subscribers and $11 for non-subscribers. Back issue prices will show some increase as well.

These changes will go into effect with the end of the current volume year, on the first of August 1991. New subscriptions, renewals and other orders received before August, including early renewals for subscriptions to expire later, will be accepted at the old prices.

WHY BUILD INSTRUMENTS?

An Account of a 7 Year Process to Overcome Exoticism.

By Guy Laramée

Guy Laramée is co-director of the Canadian ensemble TUYO.

Why build instruments? – this is a question so frequently asked, and in fact a question not easy to answer.

Founded in 1987 after four years of research, composition and instrument building, TUYO is an acoustic ensemble devoted to microtonal and gestural music, using exclusively "invented" instruments. TUYO is a diminutive for the french name for *pipe*. All the instruments except the harmonium (two accordions and a foot-operated bellows) are made of pipes.

The ensemble has been touring extensively in Quebec, Canada (with a small jump in Brussells), and a U.S. tour is planned for 91-92. Until now the ensemble has been playing music by composers Guy Laramée and Carol Bergeron, but there are plans to play music by other microtonal composers.

"But why having to build instruments?" There are two musical tendencies in the group: microtonality and gestural music, two things pretty hard to do with conventional instruments, especially if one prefers to do things acoustically and live.

I say "musical" tendencies because it was clear from the beginning that the new instruments were to serve compositional purposes. They were not to be sculptures or an end in themselves. *Practical* is the word.

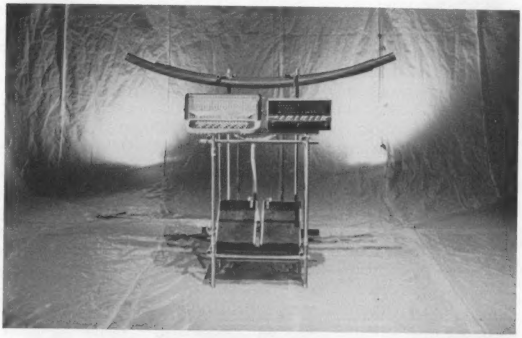
The use of pipes as the main material for building was considered a convenient choice rather than an aesthetic one. But with time, we have been interested in using that limitation for it's possible relation to science fiction on stage.

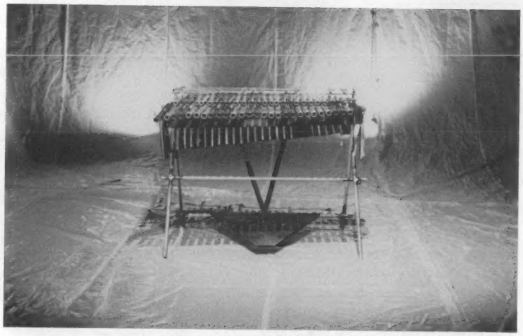
I say "on stage" because it was also clear from the beginning that the music was written for acoustic live performance. Why acoustic? No answer. A taste for a face to face with the audience. (Acoustic music: a new exoticism?) So efforts have been made so that the instruments of the ensemble be homogeneous, both in timbre and in their dynamic aspect. And visual too. We believe, as Partch did, that "concert music is a thing of the past."

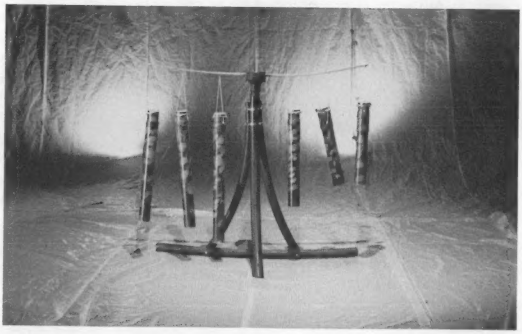
For the past two years, we have been working in the same manner theater companies do. First, the consciousness that a player is also an actor led us to withdraw all music sheets from stage. Then we came to the necessity to organize the stage as a set. Then the need for subtler changes between the pieces led us to work with a stage director. This has been determinant in realizing that the physical presence of

Photo below top: The **harmonium**, the first instrument of the ensemble (1984). Two accordions are blown by a foot-operated bellows. 36 notes per octave, tuned in just intonation.

See facing page above right for more photo captions.







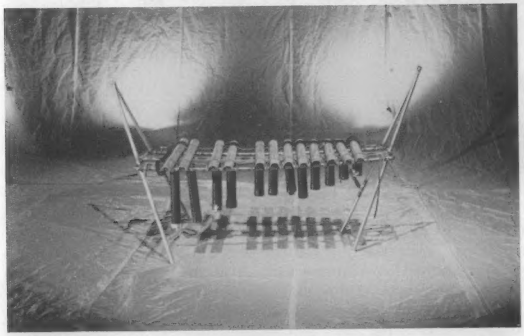
Facing page middle: The **Métalo**, an aluminum tube metalophone. 25 notes per octave, three octaves. This was the second instrument of the ensemble (1985-86).

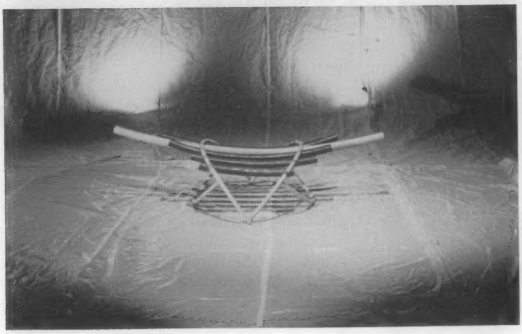
Facing page below: The **Tubes** (Eskimos have 20 names for snow...). Tuned shakers. Pellets on a membrane excite the air column.

This page top: Benoit Brodeur, Guy Laramée and Carol Bergeron playing "Les Grenouilles" by Carol Bergeron, in front of the **Léléphant**. This instrument, as big as a car, gives striking bass tones down to the C below the double bass. It uses the same acoustic principle as the small tubes in front: hitting the wall of a tube excites the air column inside the tube. Tuning is according to length. [For more on the acoustic principles behind these and similar instruments, see "Percussion Aerophones," EMI Volume VI #3, Oct. 1990.]

This page middle: The **Galére**. A lower metalophone made out of split aluminum tubes.

This page below: The **Tortue** (turtle). It uses the same principle as Léléphant, except that it is played with smaller tubes so that we get the sound of the "mallet" as well as the sound of the instrument.





the players *must* be more important than the physical presence of the instruments, however big and beautiful they might be.

So, going back to the first question, if the instruments are so hard to learn to play, if they are so hard to overcome as a presence (and so long to build and repair), *why build instruments?*

The question is so good that I came to the conclusion in 1989 that the instrument building was no longer a vital necessity for me. That these machines could even represent a diversion from the main artistic task: *finding the energy.*

That is why I am now in the process of writing an opera (a sort of) entitled *Theorie du Desert* (Desert Theory) concerned with deconstruction rather than construction. The voice is the main instrument of the 75 minute piece, and the instrument building is reduced to a minimum: an acoustic microtonal chapel organ. (Still a very big minimum: it's 19th century computer technology...)

And now, while writing this huge piece, I am realizing that writing too is no longer an absolute necessity. Music can be transmitted orally. After all, music is an oral process (a language that does not require writing), isn't it?

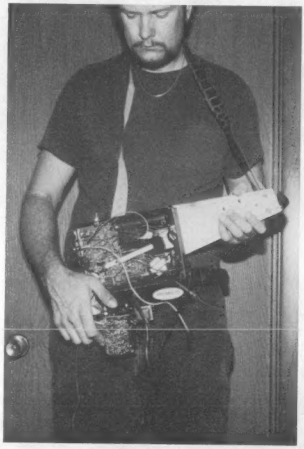
Did TUYO succeed in overcoming exoticism? I think it did and is still doing it. People see the whole thing as a confirmation that one can still make something out of nothing, and maybe make more. Simplicity is not an enemy of sophistication.

Guy Laramée and TUYO *can be reached at 4082 Berri, Montréal, Canada H2L 4H3; (514) 849-7205.*

JOHN HAJESKI'S PORTABLE ANARCHY

By Mike Hovancsek
with technical advice from John Hajeski

A few months ago I placed an ad in various music publications soliciting material for an experimental music compilation. One of the tapes I received in response to that ad was a cassette by John Hajeski (a.k.a. Busyditch) who relied primarily on home made instruments to carry out one of the most interesting aural assaults I have heard in some time.



Of particular interest are John's "Portable Anarchy"instruments, which are refreshingly simple analog contraptions built out of modified radios. Ironically, these instruments in all their simplicity are capable of producing earthy, shifting sounds that are virtually impossible to produce on more advanced, even-tempered digital instruments.

John developed his Portable Anarchy design after experimenting with radio P.C. boards in search of new and interesting ways to manipulate sounds in live performances. While poking about the circuits of an old radio with a probe from an amp meter, John located various points that produced tones, eventually stumbling upon a key transistor to which all of the "tone circuits"were connected. By shorting the tone circuits to one leg of the key transistor he was able to produce tones from the radio. After soldering a wire with a normally-closed switch to all of the tone producing circuits (most radios having 6 or 8 tone circuits), the volume and tuning knobs became modulators for the sounds produced on the open circuits.

According to John, any transistor can be modified in order to produce these results. He has used numerous resources including car radios and Walkmans (the Walkman producing a more "digital sounding" tone) each individual radio possessing its own tone qualities. He has found that "the easiest to work with is a $20.00 radio, preferably AM/FM with a built-in AC/DC converter".

Now a few warnings. With radios with built-in AC/DC converters, John Hajeski cautions that it is important to check the temperature of the transformer on occasion. He also cautions that the "audio out" on a Portable Anarchy is very hot [i.e., produces a very strong signal], making it necessary for a pot or some other device to be used as a buffer between the instrument and any recording/amplifying/processing equipment.

Since the Portable Anarchy produces a monophonic signal, John has developed a couple of strategies to further explore the possibilities of his instrument. The use of multiple P.C. boards (each with its own set of controls) has created new possibilities as has the addition of normally-open switches which allow both the switching of pre-set parameters on a signal processor and the triggering of a sampling unit. Still other developments have included adding switches that trigger pre-recorded tape loops.

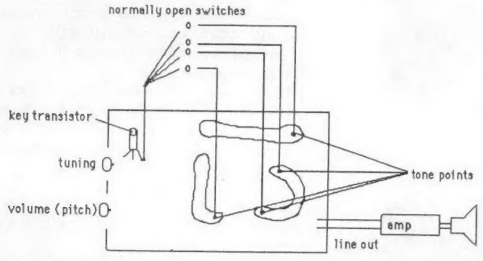
Looming ominously on the horizon are plans to attach eight radio P.C.s. to a keyboard on order to produce a polyphonic signal. Since each individual P.C. design produces a different set of tones, John plans to use eight identical P.C.s for uniform tone qualities. In this keyboard "each P.C. will have a multi-position switch to select the desired tone, as well as eight volume (pitch) controls to tune the keys to an eight-note chromatic scale".

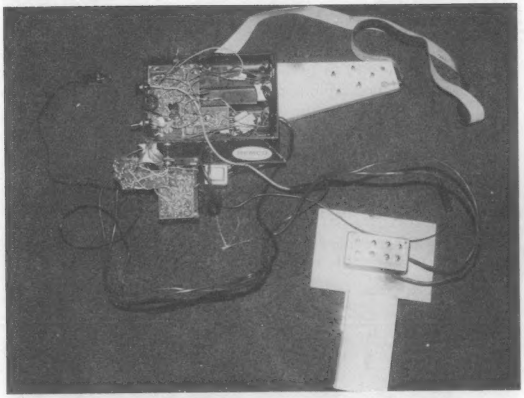
The beauty of John Hajeski's Portable Anarchy lies in its simplicity. Anyone with an old radio, soldering equipment, an amp meter, and a couple of normally-on switches can produce sounds that people owning digital equipment can only dream of creating.

The constantly shifting tone source of this instrument allows certain aleatoric elements to influence the overall sound in ways that are far more complex than the perfect cycling patterns of traditional/conventional synthesizers.

Since the radio continues to play as long as no tone switches are depressed it is possible to introduce additional elements to the sound which can be particularly effective when multiple P.C. boards are used simultaneously. Multiple P.C.s can also add to the complexity of the sound, especially when each P.C. board has its own individual sound qualities.

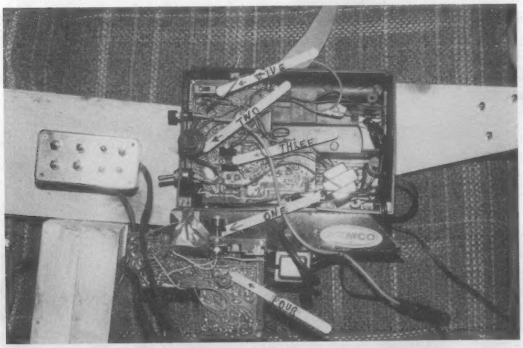
If you are interested in earthy, wild electronic sounds, give the Portable Anarchy a try. John Hajeski can be contacted at: 11 Rose St. East Rutherford, NJ 07073.





ABOVE: The John Hajeski's Portable Anarchy.

BELOW: Portable Anarchy, showing the upper and lower units (plus the footswitch at left), with the controls highlighted: Switch number one (2nd from bottom) - lower unit pitch control; Two (2nd from top) - upper unit pitch control; Three (middle) - upper unit tuning control; Four (bottom) - lower unit tuning control; Five (top) AM-FM-TV switch. The black switch above number two controls pre-sets in the effector. The toggle below it is another tone-changer. The switches on the neck (left hand) control the tones of the upper unit. Foot switch controls tones of the lower unit. Each unit has its own output (not shown) fed into a mixer.



An additional note from the editor: Instruments using some of the same principles as Portable Anarchy have been created by Michel Waisvisz in conjunction with several other technicians in The Netherlands. Waisvisz calls his instruments **Kraakdoos** ("cracklebox" in English), with more sophisticated versions being called **Kraaksynthesizer** and **Kraakorgel**. They involve deliberate short circuiting between components by means of direct contact through the player's fingers. While others have used broken down transistor radios to make functionally similar tactilly-played Cracklebox-like devices, Waisvisz' instruments usually have a keyboard-like set of metal touch-plates for the direct finger contact. For more on crackleboxes, see Hugh Davies' entry under **Kraakdoos** in **The New Grove Dictionary of Musical Instruments** (bibliography included). More recent soundworks by Michel Waisvisz include a construct called "The Hands."

NOTICES

Generator 547 Sound Art Gallery is seeking submissions for a group show of experimental musical instruments (spring 92). Please send a photo and cassette (& stamped envelope if you want it returned) to: GENERATOR 547, West 20th St., 3rd Floor, New York City 10011.

Grow your own shaker seeds. Canna Indica or "Indian Shot" canna is a 4 - 6 ft. high, tropical large leaf plant producing brilliant red flowers followed by interesting seed pods full of hard coated, black, B-B size seeds traditionally used for rattles and shakers. In cold weather regions the tubers may be stored indoors for annual seed harvest. Likes heat, sun, water, fertilizer. Easy to grow. For 20 seeds & growing instructions send $1 (cash please) and S.A.S.E. to: Richard Waters, 1462 Darby Rd., Sebastopol, CA 95472, USA.

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Ventriloquism Cassette Magazine seeks your most adventurous home recordings for its first issue. Submit on cassette, along with any information & visuals you'd like to share, and an address where you can be reached. Send all, or write with questions, to: Ventriloquism, 564 Waller St., San Francisco, CA 94117.

Now available: Xenharmonikon Nos. 7-13, cassette by experimental Indonesian composer I Wayan Sudra. Soon to be published: John Chalmers' **Divisions of the Tetrachord**. Write for complete catalogs. Frog Peak Music and American Gamelan Institute, Box A-36, Hanover, NH 03755.

I hope to be doing interviews (live and via mail) on the topic of cassette culture as part of a school-related honors project. If you are interested in this or know of any organizations/persons in Europe who would be interested, please write me at the following address, where I'll be until June 1992: Roger Skulback, Wohnheim Georg-Fahrbach-Haus, Heugerger Tor Weg 15, Zimmer 310, W 7400 Tubingen, Germany.

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EMI BACK ISSUES: Back issues of **Experimental Musical Instruments** numbered Volume VI #1 and later are individually available for $3.50 apiece. Earlier issues are available in volume sets of 6 issues each, photocopied and spiral bound: Volumes I through V, $14 per volume. Order from EMI, PO Box 784, Nicasio, CA 94946, or write for complete listing. Corresponding cassette tapes also available for each volume; see information below.

CASSETTE TAPES FROM EMI: **From the Pages of Experimental Musical Instruments**, Volumes I through VI are available at $6 per volume for subscribers; $8.50 for non-subscribers (each volume is one cassette). Each tape contains music of instruments that appeared in the newsletter during the corresponding volume year, comprising a full measure of odd, provocative, funny and beautiful music. Order from EMI, Box 784, Nicasio, CA 94946.

MY LIFE ... FOR A SOUND .... if the tune begins with a YOU.

By William Louis Soerensen.

William Louis Soerensen has been working within the sound and other combined artistic areas as film, video and sound installations since 1965. For the last ten years he has concentrated his work into larger projects as sound-sculptures, that integrate their visual and acoustic functions with the environment.

Well I, I mean ..... you, you mean .... and in between the vision, the sound, the etc. ... of any state of existence is registered as the communication of any relation, *das soziales Dasein*.

.... I mean what kicked me out of working with ordinary painting and sculpting in 1965 were these constant changes of interrelations in the processes of living. This meant cascades of new concepts because of the altered perceptions. And no specialization, thanks!

Thus I started to work with a lot of different media such as photos, films, early videos and moving pictures that required sound to exist. But in the late sixties the entire thing resulted in performing *life* as performances, and later in the seventies indoor installations and outdoor environmental works in a larger scale. You could call the whole of these activities an *intermedia* art, because my work was concentrated in the space between all the media.

At the same time, we ... a bunch of artists, writers, etc. living in the second biggest town in Denmark, called Aarhus ... had had a discussion going on creating an alternative "concert scene" in the middle of the seventies.

On this scene the audience happened to be the sound performers, which required "instruments" that should be very easy to build and play by anyone present without knowledge to music.

Well (again), in 1971 I had stayed one year in Egypt. Here I was introduced to an Arabian soundworld and life so totally different from my European background, that it seemed rather easy for me to construct a series of unclassical instruments of branches, strings and tin cans for resonance, directly taken from nature and garbage of man and drawing from the ancient acoustic cultures of Africa.

So I titled the first concert in 1977 "Resounded Sounds". The project included an instrument which could be played by more than one person at the same time, a collective interference instrument.

Five years later this instrument was developed into a string instrument which could be played upon by up to a hundred persons simultaneously. It was placed at the sidewalk of Av.du PRt. Wilson in Paris, thus constituting a sound facility for the "audience" i.e.pedestrians passing through the instrument to and from the Metro, building up what came out to be the very first sound-sculpture of mine – and it's still in the Guinness.

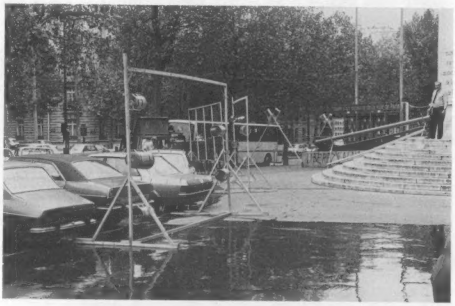
But before all that, I had done years of experimentation in acoustic as well as electrical sound production. I had even performed experiments to change the traditional use of the human voice based on inhaling and exhaling as the pure sound carrier.

From 1982 to 1987 I constructed and realized about ten bigger sound sculptures in different countries in relation to their specific culture and environment. On the following pages you are presented six of the most important of these projects and a late example of one of my soundperformances.

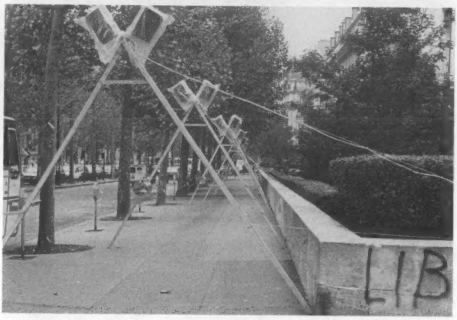
"LA FONCTION SONORE"

The soundproject shown in the four photographs below was created for the XII Biennale de Paris, 1982.

Photographs of La Fonction Sonore © Steen Hybel



To the left in the photograph above are three acoustic string instruments, each 300 x 420 cm. Two had 5 horizontal strings, while the third had 8 vertical strings of different diameters, mounted with sounding boards of different sizes. In the middle can be seen one end of the 2-stringed, seventy-meter outdoor instrument.

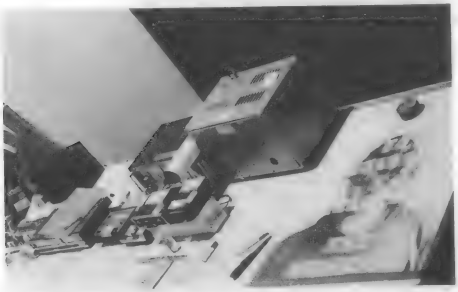


Photograph above, and upper left photo on facing page: The outdoor 2-stringed linear sound instrument with a total length of 70 meters. The strings were carried by eight A-frame uprights, dividing the strings into seven sections, all with three main sound functions for active playing: 1. An acoustic function produced by the strings and metal pots of different diameters and sizes for each section. 2. An electric function produced by a microphone, amplifier and loudspeaker for each section (this function used the speakers located at the top left of each upright). 3. A contact function activated when anyone touched the two strings placed on each side of the section at the same time. This contact brought into play a bank of tone generators and pre-recorded tape playback machines, sending their amplified signals to the speakers

located at the top right of each upright simultaneously. Anywhere from one to fourteen sound channels could be activated at once, depending on the number of people contacting the instrument at the given moment.

Below: The control center for "La Fonction Sonore" placed in the ordinary entrance of the **Musee d'Art Moderne**. It controlled the electronic functions of the outdoor linear instrument described above, as well as an indoor nonlinear instrument. The indoor instrument was placed inside the building at doorways, staircases etc., where people passed photocells and ultrasound senders and receivers. This activated one or more of the fourteen sound channels, depending on the number of people passively passing through the instruments.

The control center contained: 1. Four tape recorders constantly playing in loops with interchangeable new tapes. 2. Ten sound generators for different sound productions. 3. A 2 x 60 watt amplifier. 4. Four power supplies to feed the tape recorders, sound generators and a meter in the center itself – as well as the photocells and ultrasound sender of the indoor, and the electric functions of the outdoor instrument. 5. A meter with fourteen channels that could measure the number of people that activated the two instruments at the same time.



"LANDING GROUND FOR WADERS"

I created this project in the summer of 1983. The construction is subordinated to the surrounding landscape – a protected dike and tidal area – and thus integrated in an environment of West Jutland; but at the same time it is incongruous to this milieu. The positioning and functioning of the project are designed to structure these conditions in a way that is just as audible as visible.

A deflected wedge formation is created by six big sound elements on the shore along with sixteen small light elements, forming the point of the wedge, in the tidal area.

Ashore, the SOUNDindications of the landing ground consist of: 1 sound instrument "Howling"; i.e., a battery of about 200 empty wine bottles with their mouths directed towards southwest, west and northwest, designed to catch the changing directions of the motive power of the west wind; and 5 sound instruments "Flapping"; i.e., five upright wooden frames of different height mounted with transparent or black plastic foils of varied thicknesses and lengths. These instruments are placed in such a way that the biggest motive power is obtained by the wind from the west or the east.

At sea, the LIGHTindications of the landing ground consist of: 16 pontoons with mirrors and keels fitted on. Each pontoon is anchored with a 360 degrees mobility. The reflections of the mirrors depend on the position of the sun or clouds, ebb and flow together with the current, and the directions of the wind.

The SOUNDelements weakly dominate the normal sounds in each of the areas where they are placed and change them into differing but still coherent sound-zones. The LIGHTelements only show the entire formation or parts of it in momentary flashes; thus the visual function is periodic, subdued and coordinated with the audible function of the waterfront.

The materials for this sound sculpture were selected from the by now "natural" alien substances that can be found on the beach, such as plastic foils and bottles. The reflection of a mirror is a corresponding intensification of the ordinary light reflection from the surface of the water.

DOVREGUBBENS EAR TROMPET

The Ear Trompet was made at Geilo, Norway, April 1984, as a sound instrument in snow and ice. External environmental sounds along with edge tones from the wind were captured and modified by two plastic tubes, and resonated by two half parabolas.

The place for the construction was chosen for echoes and a wind direction as constant as possible from East or West, on the basis of research at many locations. The best place found was by the bridge crossing Ustedalsfjorden in Geilo.

The architecture of the space was designed to create a compact concentration of temporary energy. This could be obtained by turning the negative form of the valley 180 degrees as half a sphere [that is, inverting the concave form of the valley floor at its lowest point by creating a half-spherical structure] built with the air-spaced material of frozen water (i.e., snow and ice). At the same time the construction itself was determined by the optimum amplification of the resonance inside the instrument.

The social connection within the building process was planned to create as much interaction as possible with the inhabitants/audience of the town of Geilo, due to the project's very short time of nine days. A teacher, Justin Landsmark, and two classes at the local school were involved in the work.

The sound instrument based on the above-mentioned conditions took the form of two half-parabolas formed in snow with a diameter of six meters, providing acoustic resonance amplification. Sound was introduced into these by two plastic tubes, 6 meters long with diameters of 16 and 20 centimeters, producing different sound frequencies. The static sounds within the air columns added to the incoming sound from the environment (birds, talk, echoes etc.) were reflected and amplified constantly inside the parabolas. The sounds themselves came to be **the real physical object** to change the acoustic/visual situation in the surroundings of the instrument.

"A SOUNDPROJECT FOR WIND AND WATER"

This soundproject was constructed in the middle of Odense river inside the Adventuregarden of H.C. Andersen in the city of Odense, at Fyn, Denmark in June 1984.

The project had two functions:

1. The wind function, which was produced by two 5-meter plastic tubes of different diameters placed on a 7-meter mast. The tubes could move freely 360 degrees horizontally, driven by the wind. The sound from the standing air column inside the tubes and sounds picked up from outside by the revolving tubes were transmitted through microphones to a control center, and throughout the entire garden by loudspeakers.

2. The water function consisted of three instruments. Three steel strings with different lengths and diameters were connected to pontoons rotated by the waterstream, which activated the strings. At the other end of the strings, they were fixed to three masts and microphones that picked up the different frequencies, which likewise were amplified throughout the entire garden. By passing through a certain area in the garden, the unknowing audience could switch-off the whole sound output of the project – temporarily.

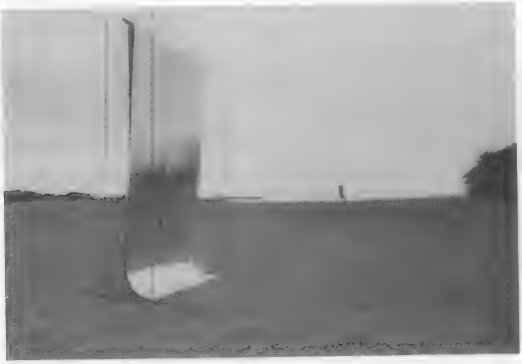
"THE SOUNDWALL"

At "Kongens Nytorv" in the center of Copenhagen, a sound instrument of sixteen tons was placed during a period of one month in August 1984 as a part of a bigger project called "Flying Concrete", dealing with the modern building material: concrete in a capital.

The sculpture itself consisted of a wall of 7 x 3 meters, connected by a heavy beam 8 meters long to an iron parabolic dish 3 meters in diameter. The iron parabola served as a sound producer.

On this sound parabola a pile driver was mounted, which by striking the parabola set it into huge vibrations. The vibrations were transmitted through the sound beam and straight into the wall.

At the same time the sound was reflected all over the city, transforming the sixteen tons of massive concrete into the actual flying object: **the sound**.



"SCANIAN SOUNDCAGES"

As a contribution to a project called **Big Scale** in Malmø, Sweden in August 1985, a sound instrument consisting of three big sound elements was built.

Each element was a cage of grated iron measuring 5 x 2.35 x 1.17 meters, containing two folded and loose membranes of aluminium, each about 10 meters long.

The three soundcages were placed in half a circle with a space of about 100 meters in between. Thus the sound zones of the cages overlapped, and from an approximate center they could all be heard in a united sound-function.

The sound sculpture was placed at the waterfront in "Öre- sundsparken", cutting the horizon to the north and corresponding in formation to the architecture of the houses at the Limhamnsroad to the south. In this way the wind was able to operate the membranes as thunder from all directions – and the light reflected from these 3 restless points as lighthouses – all day and all night.

"SPACESTRING AND SAX"

(In Danish sax = saks means a pair of scissors, so...) "Spacestring and Sax" was an indoor sound-performance at "Overgaden" in Copenhagen in 1987. This exhibition space is run by the Danish Ministry of Culture for experimental art works.

Two steel strings of different diameters were stretched seven meters parallel to each other between four columns.

The room is 14 x 9 meters with a ceiling height of four meters. The floor and roof of massive concrete create an increasingly hard resonance. The string was activated by a bow, and the sound was picked up by a low-impedance microphone carried in my left hand and then amplified diagonally from the two corners of the room. The saxophone was played acoustically by an artist colleague of mine, Erik Liljenberg.

The sound pressed the room to the utmost – and the audience up against the walls – the string creating almost a physical object of Inferno cut into slices by the howls from the sax.

"A TWO PERSONS FLOOR VIOLIN M/F."
This was one of my first collective instruments, constructed December 1976. The three strings are based on sound interference patterns, thus the pitch played on one side of the bridge will simultaneously be changed by striking the same string on the other side.

Now, you may have noticed that my first instruments were made to be activated by people, but the more my sound has grown into nature and into sculpture, the more the wind, the water and the sun have been the motive powers.

The main interest has been to cope with the physical environment, indoor and outdoor, in town or landscape, electrically and acoustically building up the project and tearing it down in keeping with an ecological mode of thought, and conceiving the entire process as comprising the workpiece.

The important thing is how to insert this sculptured sound into a specified environment, and thus add "something" to the biota that might disturb but definitely not damage the very same – and slightly change the place temporarily to a more tempting and unusual or even "unnatural" visual sounding zone.

So, when it comes down to a definition of my present soundwork I would say that the sound sculpture is the sound itself that physically forms the space into the real *object* through a series of seconds. The visual formation that you actually see is simply the instrument which produces and amplifies the sound.

The character of the sound produced is simple, and in natural environments it may be even hard for the human ear to recognize like in the "Landing grounds for Waders" or in town areas concentrated energy like the gong of the "Soundwall" or the rumbling "Scanian Soundcages" when we are speaking of acoustic instruments.

The electrical instruments such as "La Fonction Sonore" and the soundperformances of the long strings have a huge range of frequencies. "La Fonction Sonore" could change programs continuously with inputs ranging from creaking doors or the sounds of dishes being washed to pure electronically-generated wailing sounds – the latter creating a raw sound inferno that you hardly would connect with strings.

Finally, I will note that I have had no intention to work with music at all. At least not in the traditional use of the concept. It seems to me that during a decade I have been leaving the European visual-dominated logic way of thinking – in politics and religion as well as in science and art – to give a higher priority to the remaining interacting senses. To start with the sound!

So, if you have any comment or want further information (on a tape recording of the soundsculptures for example) let me HEAR from you at DK 453135ollo, or addressed to Ewaldsgade 6, 2200 Copenhagen N., Denmark.

SOUND: THE RE-CONQUERING OF SPACE AND SLOW TIME.

Some Reflections on the Sound Sculptures of William Louis Soerensen

by Jean Fischer

In this appendix I shall try to place William's sound sculptures in two contexts: in a large scale paradigmatic context and in the context of other types of sound sculpture.

According to the French philosopher Michel Foucault, we left the classic paradigm around 1800. The classic paradigm was centered around space, geometry and order. The modern paradigm after 1800 went from space to time: time, dynamics, expansion and excitement are the building stones of modernity. Our plans and utopias are situated in time and directed towards the future. Space has lost its concrete character and is a thing to be travelled through, quantified, and measured.

Around 1960 something new happened. It started with fluxus and Pop Art, and today we often talk about it as postmodernity. A kind of new paradigm showed up, though it is still more of an avant-garde phenomenon and does not permeate all levels of society. Installations, earth art, process music, minimal music, New Age music: it can all be interpreted as an expression of a desire to re-conquer concrete space and slow time. Perhaps you could talk about an American and Oriental impulse. It is zen more than Aristotle and Newton.

William's installations, environments, and sound sculpture can be placed in this context. Even if he seems obsessed by a modern dynamic, and even if he is a very complex artist, he is certainly trying to find concrete space, slow time and our relationship with nature. William's sound sculptures are often related to concrete space and are intended to find and define the character of that specific environment.

Perhaps we could make a provisional classification of sound sculpture: *a*) dadaist machines (Tinguely, von Huene), *b*) extended musical instruments or homemade musical instruments (Skip La Plante, Robert Rutman), *c*) anthropological musical instruments, eventually homemade (Harry Partch), *d*) soundscapes, i.e. landscapes portrayed in sound (Bill Fontana, Murray Schafer), *e*) New Age nature-idylls, i.e. music with recorded sounds of birds, springs and waves (lots of New Age music), *f*) wind-harps broadly defined, i.e. things that interact with wind and so produce sound (many artists have experimented with wind and water sound, from I S MacKenzie 1934 to Hans Haacke, and some of Harry Bertoia's sound sculptures can be regarded as wind-harps). Groups *b* and *c* are kind of music; New Age idylls are music with nature sounds; and dadaist machines only have sound as a kind of humoristic secondary effect. Though William has also made homemade instruments, his sound sculpture has more similarity to wind-harps and to soundscapes. It is more sculpture and space than it is music and time. But the sound is not a secondary effect, although it has nothing to do with music. It is not composed of tones, and it is not produced with musical instruments.

The sound is a research in, and an expression of, the material and form of the sculpture and the character and specifity of the surrounding space or landscape.

THE DEVIL'S FIDDLE: PAST AND PRESENT

Part Two

By Hal Rammel

This is the second half of Hal Rammel's report on the natural history of the devil's fiddle, a string-plus-percussion instrument found in diverse forms and under various names throughout Europe, North America and possibly beyond. Part One of the article, in our last issue, traced the history and evolution of the devil's fiddle family as far as four centuries back. Here in Part Two, Hal turns to more recent times, introducing the current century's crop of devil's fiddles and devil's fiddle makers.

Johannes Bredahl Fauholdt Holgersen was born in 1906 in Jutland (Denmark) to working class parents and began an apprenticeship as a carpenter in the early 20s. Around 1923, dissatisfied with living in one place with one job, Bredahl began a new life as a traveling musician, living in a tent in the summer and making his livelihood playing a two-row Hohner accordion he bought secondhand in Arhus. Such a lifestyle, unconventional and unofficial, was described at the time as *på kant* or "on the edge." If you were arrested, the police would seize your instruments. However, if payments were still due on the instrument, the police were required to continue these and, consequently, they often chose to ignore such cases. Bredahl's array of instruments dramatically increased during a stay in Hamburg in the early 30s when he met a musician forced by financial difficulties to sell his own collection: a whistle flute, a saw and a Swanee flute (made from a bicycle pump). Soon after this, Bredahl organized his first street band with four other musicians playing five-row accordion, banjo, double bass, and guitar. By 1935, with the addition of a clarinetist, they began billing themselves as *De 6 glade gårdmusikanter*, ("The Six Happy Streetmusicians"), successful enough to travel all over Denmark, playing engagements for union halls and social organizations.

Bredahl added the devil's fiddle or *rumsterstang* to his ensemble in the late 1930s. He had built his first rumsterstang at age 15 with pot lids at the top and bottom as drums. At some point, he had seen a rumsterstang used in a German orchestra performing in a temperance hotel in Grenå after the first world war. At that time, the instrument was called a *krigsdjaevel* (war devil) and had some popularity in the trenches during the war. (This is confirmed by Peinkofer and Tannigel's note in **Handbook of Percussion Instruments**, and I have seen a photograph of a WWI impromptu soldier's infirmary band with a krigsdjaevel player holding an instrument made from a stick, piece of wire, and empty battered fuel can.) Bredahl's rumsterstang in Fig. 7 used a commercially made drum with a piano wire drawn tightly across it and the familiar notched bow. A taxi horn, bicycle bell, tuned cowbells, wood blocks, and cog rattle complete the array. Bredahl had great success with his instruments. He and his orchestra made several appearances in Danish popular films (he played saw in "Sol over Danmark" in the late 1930s). He worked as a comedian and played saw in several Danish circuses. He died in 1975.

This biographical information was collected in interviews with Mr. Bredahl by Anders Enevig in 1973 and was made available to me by Anders Enevig and Mette Müller of the Musikhistorisk Museum & Carl Claudius' Samling in Copenhagen.

Hilding Ekstrand was born in Christianshavn, Denmark in 1902. His father was a tailor from Sweden who, after his apprenticeship, settled in Denmark to marry and raise a family. After short periods in a number of different professions and a period of unemployment in the late 20s, Hilding Ekstrand settled into employment as an enameller until retirement in 1968. He had a strong interest in music throughout his life. He had a fine baritone voice and sang in many ensembles and choirs during his adult life. He performed in several trade union choirs performing on radio shows and special concerts for nursing homes, social gatherings, etc. He also played harmonica and mandolin with three fellow workers in a group featuring mostly Swedish waltzes.

Figure 1: Bredahl's rumsterstang.

(Photograph by Ole Woldbye, Copenhagen, courtesy of the Musikhistorisk Museum and Carl Claudius' Sammlung, Copenhagen)

It was after his retirement, as a pensioner, that Ekstrand took the name Jøb and began to make rumsterstang, or barker's sticks. He had knowledge of the instrument from several other contemporary performers and builders of rumsterstang at the time, but his skill and experience with color enamelling brought new life to the instruments he designed and constructed. In his hands, the rumsterstang took on a life of their own: "To me it is very important that they are alive - like Pinocchio - and strong, too." He made about 500 barker's stick in his lifetime in all sizes imaginable from large ones to play to small souvenirs. In the mid 1970s, the Musikhistorisk Museum & Carl Claudius's Samling in Copenhagen opened an exhibition of homemade instruments called "Man ta'r hvad man har" or "Take what is at hand" and invited visitors to bring their own homemade instruments. Jøb appeared with his barker's sticks and several other musical inventions. Many of his

Figure 2: Hildung Ekstrand's rumsterstang, or barker's stick.

(Photograph by Ole Woldbye, Copenhagen. Courtesy of Musikhistorisk Museum & Carl Claudius' Samlung, Copenhagen.)

rumsterstang featured the large foot or shoe at the bottom of the stick and the exaggerated clown face at the top as in the instrument pictured in Fig. 8. (Note the spring placed between the cymbals and the top of the head and the familiar wire device between the string and the metal can drum.)

Jøb remained a good friend of the museum throughout the rest of his life. He was an outgoing, vivacious performer with a large repertoire of songs, poems, and stories he had written himself. He thrived on amusing and entertaining people at private parties, social events, radio and television. Jøb often called his work "primitive," but as Mette Müller notes, this was in the best sense of the word, as "original, genuine self expression."

Today, his barker's sticks are performed on by many professional and amateur entertainers and can be found in instrument collections around the world. He died in 1981.

This information was complied from Mette Müller's "Kan du huske Jøb?" ("Do you remember Job?"), written for an exhibition in Job's memory at the Musikhistorisk Museum & Carl Claudius' Samling, Copenhagen, translated by Alice Fleusbas and made available to me by Mette Müller, director of the museum.

The extensive documented record of folk music instruments in parts of central and eastern Europe seems to indicate that the bumbass and its kin have had greater popularity there in more recent times, often appearing as the rhythmic accompaniment in small ensembles that include accordion, harmonica, and vocalists. Scholarly publications like **Jahrbuch des Osterreichischen Volksliedwerkes** (edited by Gerlinde Haid, Vienna), **Volkstumliche Musikinstrumente in den Alpen** (edited by Karl M. Klier, Basel), and **Die Volksmusikinstrumente der Tschechoslowakei** (edited by Oskar Elschek, Leipzig) offer monographs on a multitude of recent examples of these instruments found in various parts of Czechoslovakia and Austria. I will describe two from photographs published in these publications.

Johann Pagitsch of Salzburg, photographed in 1947 at age 63, plays a bumbass that appears to be rebuilt from one of the commercially made German models. The body looks very much like one of Armin Voigt's instruments but the animal bladder has been replaced with a large toy balloon, held by the string against the wooden board. In addition to the bumbass, Pagitsch plays a harmonica also mounted on a pole braced by his foot and resting at mouth level. It looks like a "corncob" harmonica, i.e. four harmonicas mounted together on a central, longitudinal axle.

Marcel Curgaly, photographed in Czechoslovakia in 1974 plays a very tall bumbass with two strings passing directly across a round drumlike resonator. A large cymbal is fastened vertically to the pole right behind the drum. Two cymbals sit at the top of the staff but these are surmounted by a "limberjack" figure, a loosely jointed wooden doll that would dance wildly on the cymbals as the pole is hit against the ground. The photo shows Mr. Curgaly holding the long bow (with widely spaced teeth) against the pole, perhaps indicating that the pole itself might be bowed for additional percussive sound.

Figure 3: An Austrian Saugeige, with two metal canister resonators and two strings, a bit over 5 ft. in height.

The duo of Kaiser and Haberler perform today on the streets of Eisenstadt, Austria. Reinhard Kaiser plays the button box accordion and Gunther Haberler holds the *Teufelsgiege*. Herr Haberler's devil's violin adds a small washboard to the familiar arrangement of string and drum. The modeling of the pole and the four bells at the top are very much like the old German models, so perhaps this is a remodeled updated instrument. A cowbell and tambourine are fixed to the pole and a bicycle horn is tucked behind the washboard. A wonderful bright red devil's head with cotton hair and beard surveys the scene from atop the staff. The bow is a simple stick, narrow and notched, to be used as both bow and drumstick.

This devil's violin (Fig. 6) was collected in Poland in the 1960s, however, no other information about it is available. Another photo of this instrument can be found in

Figure 4: The duo of Reinhard Kaiser (button box) and Günther Haberler (teufelsgeige), Eisenstadt, Vienna.

(Photo courtesy of Rudolph Pietsch, Institut für Volkmusikforschung an der Hochschule für Musik und darstellende Kunst in Wein.)

LEFT - Figure 5: Closeup of the top of Günther Haberler's teufelsgeige with devil's head.

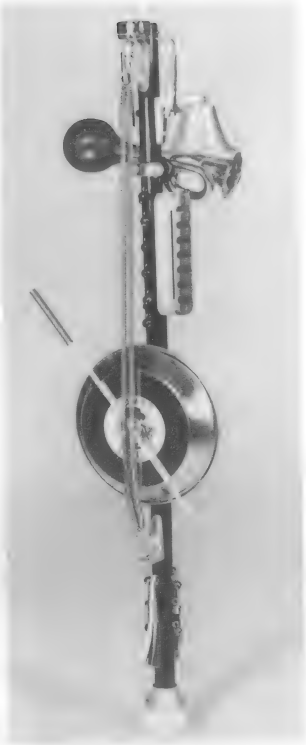
(Photo courtesy Rudolf Pietsch, Institut für Volksmusikforschung, Vienna.)

BELOW - Figure 6: Devil's fiddle collected in Poland int the 1960s.

(Photo courtesy of the Horniman Museum, London.)

RIGHT - Figure 7: Stumpf Fiddle manufactured by the Sheboygan Fiddle Factory, Sheboygan, Wisconsin.

(Photo courtesy of the Sheboygan Fiddle Factory.)

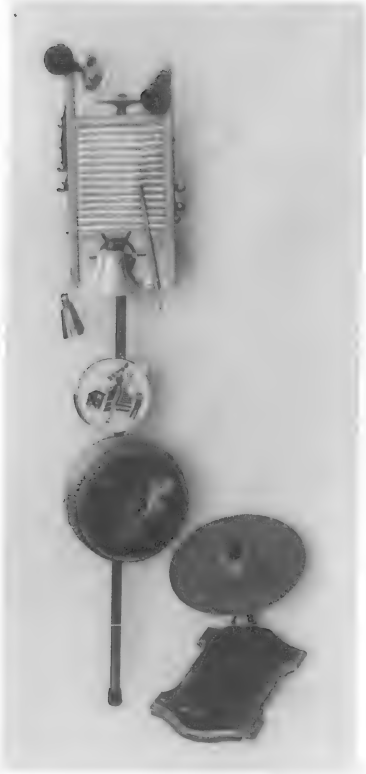


James Blades' **Percussion Instruments and Their History** (Plate 150) where is it a bit clearer that the two cymbals form the brim of the devil's "high hat." The streamers fixed to the top of the hat and to the pole are common on eastern European varieties of the instrument. The resonator appears to be a cardboard box with two strings holding it against the violin-shaped wooden back. Again, the bow is a notched stick.[1]

The Sheboygan (Wisconsin) Fiddle Factory has been manufacturing their own variety of devil's fiddle since 1975. Called the *Stumpf Fiddle*, it was designed by Charlie and Robert Cronen, and under the marketing guidance of William Schwartz they have turned out some 30,000 Stumpf Fiddles. Their instrument replaces the wire string and notched bow of the bumbass with two metal strings stretched across a resonator made from two pie plates. The springs, when scraped with a dowel rod "beater," have a rhythmic effect not unlike the sound of the bumbass or a washboard. Pellet bells attached to the pole and BBs in the pie plate resonator sound when the stick is bounced on the ground (the base is made from a rubber ball and a wooden handle replaces the head and cymbals at the top of the stick). Bicycle horn and bell, aluminum bell and wood blocks adorn the sides of the pole. Since 1976, Sheboygan's annual Bratwurst Day has included a Stumpf Fiddle contest with contestants performing on Stumpf Fiddles or related instruments of their own design and construction. At the 1987 contest I attended, of eight performers, four played on homemade instruments. All were based on the Stumpf Fiddle Factory model of using springs as the primary soundsource with a handle at the top of the pole.

The instrument in Fig. 8 (next page) belonged to Chicago vaudeville musician/comedian Benny Dugoll. It was given to me by friends who bought it along with a closet full of clown costumes at an apartment sale arranged by Dugoll's family when he passed away in the mid 80s. He lived only a few blocks from my apartment and on their way here, my friends heard two neighbors remark: "What a fine looking stump fiddle."

Benny Dugoll was active on the Chicago music scene for many decades, playing bass saxophone, sousaphone, and double bass in numerous hotel orchestras around the city. He performed in the Bughouse Orchestra of the popular stage-



ABOVE LEFT - Figure 8: Benny Dugoll's "stump fiddle" (author's collection).

CENTER - Figure 9: Peripola built by Peripole, Inc., New York, 1940s-60s? (Photo courtesy of the Shrine to Music Museum, Vermillion, South Dakota.)

RIGHT - Figure 10: Devil's fiddle built by the author.

show "Screwballs of 1941": "The wackiest, looniest, craziest pandemonium parade of loose screws to ever break out of the bughouse ... but it's swell entertainment." Throughout these years, he led a number of small nightclub bands of his own, including the Musical Minute Men and the Casino Boys. The Casino Boys or Benny Dugoll's Novelty Band offered itself as a continuous floor show, many bands in one, including a German band, a clown band, a square dance band, and a polka band, all with appropriate costume changes. "You must SEE them as well as HEAR them!" read their promotional flyer. The instrument in Fig. 89 must have been one of Dugoll's "novelties by the score" for part of the Korny Klown's turn. The two small cymbals at the top of the stick confirm this instrument's affinity with the devil's fiddle, the washboard's percussive effect sounding quite similar to the Stumpf Fiddle scraped spring and the bumbass' notched bow. Dugoll adds bicycle horn and bell, cowbells, a metal toy tambourine, and a small drum. The one-man band effect is completed with a homemade sock cymbal at his feet.

The Peripola or Pogo Cello is a commercially made instrument built by Peripole, Inc. of Far Rockaway, NY, possibly in the 1940s. It is five feet high. A metal resonator is fixed to a 1 x 2" pole with a semi-circular smiling face and three sets of jingles at the top. The wire string is fixed with a turnbuckle to the top of the pole and like many other varieties of the instrument passes through the wire mechanism on the sounding surface of the resonator. A flyer from the Peripole company promotes the Peripola as an excellent rhythmic accompanying instrument for amateur and professional square dancing ensembles and country bands. It suggests the use of the instrument in high school bands as part of marching and field formation activities (like a Turkish crescent) and in therapy work with mentally handicapped children. Brief instructions at the bottom of the sheet suggest further experimentation: "Try some other playing techniques. Tap the round drum, the wire and wood stem with the notched bow as you bounce the instrument. Bow the edges of the jingles."

Dallas Cline in **Cornstalk Fiddle and Other Homemade Instruments** (New York: Oak Publications, 1976) reports that similar instruments were sold in the old Sears catalog. In Cline's instructions for building a "Devil's Dream" a string (banjo or guitar string) passes over a tambourine near the bottom of the stick. A small bridge holds the string above the head of the tambourine and Cline suggests fingering the string against the pole and plucking it instead of using a bow. A pot lid or cymbal sits at the top of the stick. A kazoo, cowbell, bicycle horn or "any other noise gadgets" can be added to the rake handle pole.[2]

The instrument in Fig. 10 (previous page) was built as part of my research for this article. I used a six foot rake handle and fastened a battered pair of six inch diameter cymbals to the top, just above a rather traditional looking devil's head of papier mâché. The resonator comes from an old banjo with a new head attached. A ring of several pellet bells and beads form a necklace around the devil's neck. The drum mechanism is easily put together with only a slight adjustment required of the wire's angle to set the mallet to rest at a proper distance above the drumhead. A turnbuckle works well for adjusting the tension on the wire so that the mallet strikes the drum with some snap, then returns in place as the bow's teeth scrape across. I tried several bow designs. Rounding off the teeth slightly creates a smoother bowing stroke. This instrument can only be bowed in one direction. With some modification, a second string could be added an inch or so apart from the first with its own wire mechanism to strike on the opposite side of the drum. Bowing forward on one string and back on the other would produce a continuous drumroll. The height and the number of added sound devices add weight to the instrument (considering this instrument's height, I left it pretty spare). Playing the devil's fiddle is a bit like rubbing your stomach and patting your head at the same time. The Stumpf Fiddle's rubber ball foot is a very helpful innovation here, providing just an extra bit of mechanical "lift off" for the next beat against the ground. A spring foot would work well here, too. That was an option offered with the bumbass sold through Carl Fischer's catalog in the 1920s. Fischer's "bumbass (Jazz Bass)" sold for $7.65 or $10.75 with spring foot.

CONCLUSIONS

Extant devil's violins and the many variations are rare items in musical instrument collections across Europe and the United States. (The wealth of information and examples provided to me by Mette Müller of the Musichistorisk and Carl Claudius' Samlingof Copenhagen and Anton Pietsch of the Institut für Volksmusikförschung, Vienna, were indeed the exceptions.) However, I must note again that this does not reflect the instrument's wide distribution or mercurial popularity. Before turning to a few summary comments, I offer, as further evidence of its elusive nature, these few fleeting glimpses of the devil's fiddle.

The devil's fiddle was the instrument of choice for Gomez of the television show "The Addams Family" in at least one of the family's parlor musical gatherings. In Dunsan Makavejev's film "The Coca-Cola Kid" (1984) the country band (Conways Carnival) performing "Waltzing Matilda" includes a lagerphone player who, in addition to hitting the stick against the ground strikes it with a stick swung in a mock-bowing fashion. (A lagerphone also appears in an earlier scene in the movie.) In Walt Disney's "Mary Poppins" (1964) one of the musicians in the animated street corner band holds a devil's fiddle of unique design. The string on this shoulder-high pole (topped with cymbals) passes through a rubber ball that rests right over the small drum near the lower end of the stick. The player snaps the string so that the ball bounces back and forth against the drumhead as he hits the pole against the ground.

This survey has been a challenge to say as much as possible about the little that is known, taking scattered details and trying to make linear sense from the confused mess of the "big picture" of history. This essay examines a few extant instruments, remnants of vast areas of vernacular musicking, with an emphasis that all in all gives unfair weight to the artifact. These instruments, however, ephemeral and unconventional, served as the focal point for some very boisterous and joyous musical gatherings. In other words, emphasis on the artifact makes it too easy, in the words of Christopher Small, to "ignore and even obscure ... music's continuing nature as act rather than thing."[3] That is why the bits of information I was able to gather on Johannes Bredahl Faurholdt Holgersen and Hilding Ekstrand seemed so vital in this project. We must not lose touch with these lives lived *på kant*, on the edges of human and musical history, focused around musical instruments so simply and perfectly constructed, setting the rhythms for small ensembles at parties, community events, seasonal and personal celebrations, inspiring and nurturing for everyone present the shared pleasures of dancing and laughing.

FOOTNOTES

1.James Blades, **Percussion Instruments and Their History** (London: Faber and Faber, 1970), pp 313-4.

2.Dallas Cline, **Cornstalk Fiddle and Other Homemade Instruments** (New York: Oak Publications, 1976), pp 60-1.

3.Christopher Small, **Music of the Common Tongue: Survival and Celebration in Afro-American Music** (New York: Riverrun Press, 1987), p 378.

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THE AEROPHOR — A BREATHSAVING INVENTION

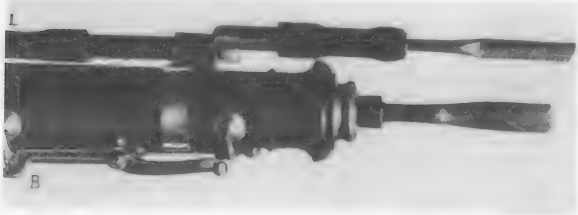
By Dr. Margaret Downie Banks,
Curator, The Shrine to Music Museum

Reprinted with permission from the **Newsletter of the American Musical Instrument Society**, (June/October 1990).

In a testimonial, written to Carl Fischer and printed in the August 1914 issue of *The Metronome*, Alfred Hertz, conductor of the Metropolitan Opera House Orchestra, wrote: "I have, for some time past, been calling attention in New York to the remarkable merits of the 'Aerophor' and will not rest until each wind instrument player of the Metropolitan Opera House uses one. I consider it the greatest progressive step in the history of wind instruments since the invention of valves."

The aerophor, a tone-sustaining device for wind instruments, was invented in 1911 by the German flutist, Bernhard Samuels. It consists of a foot- or arm-operated bellows which "forces the air through a vessel of water heated by an electric lamp to the temperature of [the player's] breath and thence through a rubber tube into the mouth, through one and sometimes two mouth-pieces. All the player of the instrument need do, whether he is playing the tuba or the flute or the oboe, is to maintain this current of air and to use the proper embouchure." By this means, players could artificially supply air to their instruments without interrupting tonal production.

The potential benefits of the aerophor were many, according to several *Metronome* articles (1914-15) written about the device. Players could sustain



PHOTOS

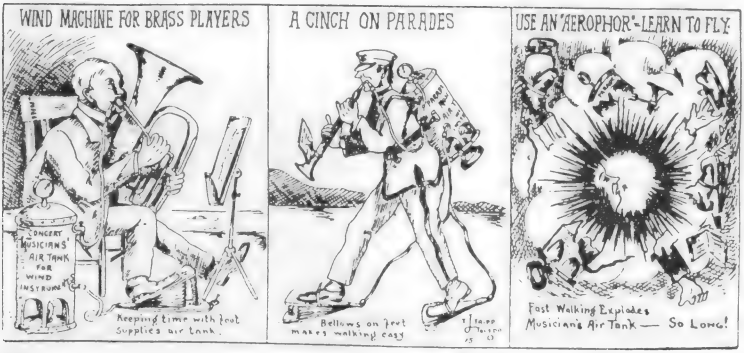
Left: Illustration showing attachment of the Aerophor to an oboe, B) The oboe; L) Aerophor attachment, showing tubing and mouthpiece.

Above: Mr. Bernard Samuels, invenror of the Aerophor, showing invention attached to a flute.

Below: Cartoons by T.J. Tripp from **The Detroit Free Press**, 1915..

Facing page: Emil Teuschert, tuba player of the Opera House at Dresden, receiving instructions on the Aerophor from Mr. Barnard Samuels. At left, Franz Schulz, tuba player at the Schwerin Opera House.

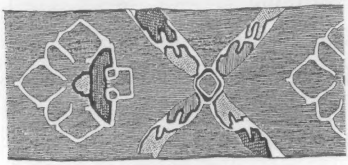
Photos and cartoon courtesy of the Shrine to Music Museum.



long, unbroken phrases of any duration; prolonged, rapid passages could be played as easily on wind as on stringed instruments; every imaginable kind of staccato effect could be produced; and, last, but certainly not least, the aerophor required "absolutely no exertion." According to the inventor, the "hygenic benefits" of the aerophor included the reduction of air pressure in the lungs, counteracting the manifestation of emphysema; it also prevented the "injurious accretion of blood in the head and allowed a more regular supply of oxygen for the blood." No more giddy oboists!

Samuels argued that any number of orchestral wind passages simply could not be performed according to the composer's original intent without the use of the aerophor, including passages in Wagner's *Der Ring des Nibelungen, Tristan und Isolde*,and *Parsifal*. Attracted by its possibilities, Richard Strauss specifically called for the use of the aerophor in his *Alpensinfonie* and *Festliches Praeludium*.

The fate of Samuel's breathsaving invention may have been best prophesized by T.J. Tripp of Toledo, Ohio, whose cartoons in a 1915 issue of *The Detroit Free Press* are reproduced here.



RECORDINGS REVIEWS

By Mike Hovancsek

THE OFFICIAL MAY 18th & 19th OPEN HOUSE IN THE GARAGE SOLO QUARTET:
THE OFFICIAL JUNE 9, 1991 E.V. ELECTRONIC COTTAGE DOORMATS

JOHN BERNDT AND tENTATIVELY, A cONVENIENCE:
NOVEMBER 21 '87 E.V. TO APRIL 16 '89 E.V.

On cassette, from Dialectical Immaterialism Press P.O. Box 22142 Baltimore, M.D. 21203, or from WiDEMOuth Tapes, PO Box 382, Baltimore, MD 21203.

Try not to be confused. tENTATIVELY, A cONVENIENCE is a person. He likes to use bulky, tedious titles and minimal liner notes to keep his listeners in a perpetual state of confusion. These two tapes [along with several others not reviewed here] are the product of tENT's work with various other like-minded musicians. Both tapes include a myriad of unusual instruments and sound sources including self-built effects boxes, rubberized drum kit, guitar with a telephone bell attached to it, amplified canned foods and a guitar played with a "magic fingers" massage unit. Cello, synthesizer, bass, sax and other more conventional instruments are used as well.

The sounds these musicians produce is often harsh, chaotic, and hard to follow, ranging from a-rhythmic barrages of sound to chunks of nervous, rigid rhythms. At its weakest moments this music can sound like a recording of the world's longest sound check. At its best it is a free form journey into unusual and difficult sounds.

November 21... is a more technically advanced recording than *The Official...*.John Berndt edited *November 21...* so that it is more varied and less self-indulgent, excerpting improvisations to more appropriate lengths and creating rapid transitions between pieces. In addition, the recording quality of *November 21...* is much clearer, allowing the listener to follow the development more easily.

For more information on tENTATIVELY, a cONVENIENCE see EMI volume VI #1.

MICHEL DENEUVE: **A CRYSTAL JOURNEY**

On cassette and CD, from Sycamore/Apple Center/Polygone in France (no address given).

A Crystal Journey is Michel Deneuve's work with the Baschet brothers' Cristal (for more on the incredible instruments of the Baschet brothers see EMI Volume III #3 and Volume IV #1).

Judging by the title of this recording one might expect it to fall into the vapid parameters of new age music, particularly considering the soft, ethereal sounds that glass instruments like the Cristal are capable of producing. If you are looking for dreamy fluff, however, I suggest you look elsewhere. Michel does an admirable job exploring the sounds that this Baschet instrument is capable of producing. The music ranges from chamber music counterpoint to haunting atonal pieces that unleash some of the more unusual qualities of the Cristal.The instruments that Michel chooses to accompany the Cristal are astonishingly effective in producing contrasts without overshadowing the featured instrument. A contrabass fills out the bass end of the pitch range and adds an earthier element to the ethereal glass sounds. The percussion ranges from rapid, studied passages reminiscent of the brilliant percussion ensemble works of 20th Century luminaries like Lou Harrison and Sydney Hodkinson to pieces that were clearly influenced by the folk musics of India (among other cultures).

Contrasting timbres are very important when glass instruments are employed because friction activated glass instruments produce a sound that is more overtone-like than sounds produced by conventional instru-

ments. Although these delicate, ethereal sounds are complex and unusual, they are also very difficult to record and concentrate on because of their uncentered, vague timbres. The additional instruments in *A Crystal Journey* are, thus, practical and effective tools to capture and realize the potentials of the Cristal.

The Cristal is a truly remarkable instrument which is demonstrated on this recording not only in its versatility but in its playability as well. Quite often instrument designers create instruments that only the designers themselves are capable of playing effectively. In the case of most of the Baschet instruments, however, the beauty and eeriness lurk right within the reach of curious fingers. In the hands of Michel Deneuve the Cristal is a vehicle for the brilliance of both the instrument designers and the performer.

VARIOUS ARTISTS: **The AERIAL** ISSUES 1-3

Audio magazine available on cassette or CD from Nonsequitur Foundation, P.O. Box 15118 Santa Fe, NM 87506.

The Aerial is a non-profit "audio publishing venture" that releases beautifully packaged, high quality compilations on CD and cassette. Each release centers around innovative experiments in sound accompanied by complete and informative liner notes detailing the background of each artist and his/her contribution to the release.

Each issue of *The Aerial* contains pieces focusing on homemade instruments, unusual sound sources, and expanded techniques for standard instruments. Although there are too many pieces of interest to detail here, I have singled out a couple from each issue.

The Aerial #1 includes an incredible improvisation by the Lost Souls for "Home-made bass recorder, fiddle, and voice", a piece for voices, gourd guitar, and gourd saxophones by the Floating Concrete Octopus, and a tape cut-up of door, water, click and pin-ball sounds by Stuart Sherman. A few spoken word pieces and interesting extended vocal works are also welcome additions to this release.

The Aerial #2 includes David Dunn's "Chaos and the Emergent Mind of the Pond" which is a surprisingly active piece of mixed sounds recorded below the surface of a pond. Annea Lockwood composed a beautiful piece for didjeridoo, voice and conch shell which is particularly effective, and Christopher Shultis composed and performed "motion/less" for vibraphone, piano interior, almglocken, stainless steel bowls, and wind gong.

The Aerial #3 begins with a long-string piece by Ellen Fullman (see EMI Vol. I #2). Nicolas Collins' "trombone-propelled electronics" (a sampling unit that is modified by the slide of a trombone and is amplified through a speaker mounted in the trombone's bell) makes two appearances, and Tom Guralnick's (not so) mobile saxophone unit (see EMI Volume VI #3) gets out and stretches its legs for a while too.

The Aerial outshines most compilation projects of its kind by successfully finding the balance between variety and continuity. All three of these releases incorporate a wealth of fascinating approaches to the creation and modification of sound without ever lingering too long at any particular style, sound or approach.

Anyone having recordings involving experimental or homemade instruments may send them for review to Mike Hovancsek, 1228 Fairview Dr., Kent, OH 44240, USA.

The following list contains selected articles relating to unusual musical instruments which have appeared recently in other publications.

"Clara Rockmore: The Art of the Theremin" by Thomas Rhea, and "Bourges International Festival of Electronic Music", both in **Computer Music Journal** Vol. 13 #1, Fall 1991.

The first of these articles is a review of early recordings by the preeminent theremin virtuoso of the instrument's hey-day, Clara Rockmore, recently re-released on CD (Delos International CD 1014). In addition to commenting on the performances (which he finds magnificent), the reviewer goes into considerable depth on the instrument itself and its history. The second article reports on the 1989 and 1990 editions of the electronic music festival at Bourges, France. The organizers of the '89 and '90 symposia placed a special emphasis on the history of electronic music and its pioneers. Leo Theremin himself, 95 years old, appeared and performed at the 1989 festival – this following 50 years in during which his whereabouts and activities were completely unknown in the west. Important figures associated with Ondes Martenot, Trautonium, Moog Synthesizer and other pioneering electronic instruments appeared as well.

"Manufacturing Secrecy: The Dueling Cymbalmakers of North America" by David H. Shayt, in **Percussive Notes** Volume 30 #1, October 1991 (PAS, PO Box 25, Lawton, OK 735025).

A fascinating, carefully documented account of cymbal and gong making in the Sabian and Zildjian factories. The author includes discussions of family history (the two makers both trace their roots to the same 17th-century Armenian cymbal maker), descriptions of manufacturing processes (along with speculation about the nature of the famous "family secret" for producing the world's best cymbals), and recent innovations resulting from the intense competition between the two firms.

Musical Instrument or Tool" by Benjamin Vogel, in **Newsletter of the American Musical Instrument Society** Vol. XX #2, June 1991 (414 E. Clark St., Vermillion, SD 57069-2390).

The author presents his thoughts on how to re-define the terminology and categorization systems for musical instruments, in light of an expansion over the years in the types of sound sources used in mainstream music.

"Resurrecting the Pythagorean Monochord" by Ben Saferstein, in **The Physics Teacher**, October 1991.

Plans for constructing a monochord for use in a high school physics lesson. The author also provides some suggestions for the lesson plan and discusses the potential of the monochord to make for an especially effective physics teaching tool.

"The Basement Builders: Homer Welty Update" by Becky Blackly, in **Autoharpoholic** Vol. 12 #4, Oct-Dec 1991 (PO Box 504, Brisbane, CA 94005).

Homer Welty makes oversized autoharps with innovative floating, plate-tuned soundboard designs. His work was featured in an earlier issue of **Autoharpoholic**, and here we get a second look, including several photographs.

"Le Sud-est Asiatique au Rythme du Gong" by Heiko Schäfer (in French), in **Percussions** No. 16, Oct. 1991 (18 rue Théodore-Rousseau, F-77930 Chailly-en-Bière, France).

Percussions has a regular column devoted to musical instruments of the world; in this issue it is devoted to gongs.

"A Contribution to Musicalism: An Attempt to Interpret Music in Painting" by Pierre Y. Karinthi, in **Leonardo** Volume 24 #4, 1991 (2030 Addison St., Berkeley, CA 94704).

The author describes a set of rules for mapping musical parameters into painting, providing a formal mechanism for realizing existing musical compositions on the canvas in a non-subjective manner.

"Vandoren Expands to Meet Growing Demand" (no author credited) in **Music Trades**, September 1991 (PO Box 432, Englewood, NJ 07631).

A report on increasingly automated production techniques at a large woodwind reed making factory (75,000 reeds produced per day, using digitally-controlled cane splitting equipment and automated reed-strength sorting machinery). The article also touches on the problem of commercial and residential real estate development in the cane growing regions of France, leading to reduced cane production and resulting shortages.

"Going to the Ends of the Earth for Good Wood (no author credited) in **Music Trades**, October 1991 (address above).

A report on the Exotic Woods company and its work in obtaining increasingly rare tropical hardwoods for musical instrument manufacture.

Vital, an English language small magazine on contemporary underground electronic and electro-acoustic music published in Europe (Opaalstraat 19, 6534 XK Nijmegen, The Netherlands), has had articles about composers who use unusual sound sources in each of its last several issues. Issue 19, April 1991, features an interview with Asmus Tietchens, who uses a variety of concrete sources, usually heavily processed electronically. Issue 20, June 1991, features an interview with Scott Konzelmann of Chop Shop, who creates sound installations based in found objects and has lately created a set of "speaker constructions" – installations using speakers of varying quality in connection with other found sound sources. Issue 21, Sept. 1991 features an interview with Christian Renou (recording under the name Brume), who uses a variety of home-built instruments on his recordings, as well as a lot of electronic and tape manipulation.